



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,688	10/15/2003	Ronald L. Hodge	08286.105015	9703

7590 05/04/2005

Michael L. Wach, Patent Agent
KING & SPALDING LLP
45th Floor
191 Peachtree Street, N.E.
Atlanta, GA 30303

EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT	PAPER NUMBER
----------	--------------

2874

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,688

Applicant(s)

HODGE ET AL.

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 21-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-24 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1003.0304.0604.1104</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-20, drawn to a method and system for suppressing back reflections, classified in class 385, subclass 32.
- II. Claims 21-24, drawn to a housing apparatus for an optical source and an optical fiber, classified in class 385, subclass 88.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a method or system for controlling back reflections in any optical device and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation with Michael L. Wach on April 29, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-24 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

The prior art documents submitted by applicant in the Information Disclosure Statements filed on October 15, 2003; March 15, 2004; June 23, 2004; and November 3, 2004 have all been considered and made of record, with the exception of the references that are lined through on the Information Disclosure Statement filed March 15, 2004, for which no copies of the references were available (note the attached copies of form PTO-1449).

The examiner notes that in the Information Disclosure Statement filed March 15, 2004, Applicant states that "The attached Form PTO-1449 list references that were

Art Unit: 2874

cited in the parent application of U.S. Application No. 09/899,410. The present application claims priority to the parent application under 35 U.S.C. 120 and therefore, copies of the references are not enclosed...". However, a claim for priority to U.S. Application No. 09/899,410 has not been made in the present application. In any event, the references that have been crossed out are not currently present in U.S. Application No. 09/899,410 and could not be considered.

Drawings

Eleven (11) sheets of formal drawings were filed on October 15, 2003.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-13 and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Liao et al. (CA 2107922 A1).

Regarding claims 1 and 2; Liao et al. discloses a method for managing back reflections (reflection control) in an optical system (see Figures 1A-1B and 2A-2D and the abstract) comprising:

Art Unit: 2874

- forming a coiled optical waveguide (fiber optic) around a coiling device (a large shaft; see page 4, line 18, through page 6, line 24);
- wherein forming the coiled waveguide comprises forming a coil with a plurality of loops (the bending loss is proportional to the number of loops formed by the fiber optics, see page 5, lines 15-17).

Regarding claims 4-7; the method of Liao et al. comprises:

- forming the coiled waveguide comprising wedging a section of waveguide into an impinging region of the coiling device (see Figure 2B);
- coupling light from a core of the coiled waveguide to a cladding of the coiled waveguide;
- forming a coil with a number of loops;
- specifying the number of loops to meet an optical networking specification (the desired bending loss); and
- forming a coiled waveguide around a spool (the large shaft).

Regarding claim 8-13, 15 and 16; Liao et al. discloses an optical system (see Figure 1B) comprising an optical waveguide (3) and a radius controlling device (large shaft, 23; see Figure 2B), the optical waveguide comprising:

- a cylindrical core having a first refractive index, the core comprising a light conducting material operative to guide light (this is an inherent property of optical fibers);

- a cladding axially surrounding the core operative to guide light, the cladding having a second refractive index lower than the first refractive index (this is an inherent property of optical fibers);
- a first end;
- a second end opposite to the first end, the second end comprising an end face (C) operative to reflect light back into the cylindrical core; and
- a coil (2) between the first end and the second end operative to suppress reflection from the end face (C), wherein the coil is formed around the radius controlling device (23) with a controlled radius operative to attenuate guided light while controlling mechanical stresses of the optical waveguide (3);
- wherein the radius controlling device (23) comprising a spool;
- wherein the coil with the controlled radius is further operative to attenuate light by coupling guided light out of the core and into the cladding;
- wherein the controlled radius is further operative to minimize the risk of fracture of the optical waveguide (see page 6, lines 4-9);
- wherein the coil comprises a plurality of loops;
- wherein the coil comprises a number of loops, the number selected on the basis of a return loss specification (see page 5, lines 15-17 and the abstract);
- wherein the coil (2) is adjacent to the end face (C); and

Art Unit: 2874

- wherein the optical waveguide is a pigtail optical fiber.

Regarding claims 17 and 18; Liao et al. discloses an optical system (see Figures 1B and 2B), comprising:

- a spool (23) having a radius; and
- an optical fiber (3) having a source end, an exposed end face (C) opposite the source end, and a section (2) adjacent the exposed end face;
- wherein the section (2) is coiled around the spool (23) and is operative to suppress reflections from the exposed end face (C);
- wherein the spool (23) comprises an impinging region and at least some portion of the section (2) is wedged in the impinging region.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiba et al. (JP 10-20123).

Regarding claims 1 and 2; Chiba et al. discloses a method for attenuating an optical signal in an optical fiber comprising:

- forming a coiled optical waveguide (optical fiber, 22) around a coiling device (23);

- wherein forming the coiled waveguide (22) comprises forming a coil with a plurality of loops.

Chiba et al. does not specifically state that the method is for managing back reflections in an optical system. However, the practice of managing back reflections in an optical system through attenuation by forming a coiled optical waveguide is known in the art (see the abstracts of Akikuni et al. (JP 11-305052); Sakai et al. (JP 07-20327); and Liao et al. (CA 2107922 A1)). Therefore, one of ordinary skill in the art would have found it obvious to use the method of attenuation disclosed by Chiba et al. to manage back reflections in an optical system.

Regarding claim 3; Chiba et al. discloses all of the limitations of claim 3 as applied above, except for the loops having a radius less than 0.5 inches. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the radius be any value depending on the physical characteristics of the particular optical fiber employed in the invention, including less than 0.5 inches, to accommodate an optical fiber while maintaining a bending radius that will prevent the fiber from breaking, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 203) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claims 5-7; the method of Chiba et al. comprises:

Art Unit: 2874

- coupling light from a core of the coiled waveguide to a cladding of the coiled waveguide;
- forming a coil with a number of loops; and
- specifying the number of loops to meet an optical networking specification (the desired attenuation); and
- forming a coiled waveguide around a spool (23).

Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liao et al. (CA 2107922 A1).

Regarding claims 3 and 14; Liao et al. discloses all of the limitations of these claims as applied above, except for the loops having a radius less than 0.5 inches; or for having the controlled radius be less than 12 mm and more than 2 mm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the radius be any value depending on the physical characteristics of the particular optical fiber employed in the invention, including less than 0.5 inches or between 2 mm and 12 mm, to accommodate an optical fiber while maintaining a bending radius that will prevent the fiber from breaking, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 203) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Regarding claim 19; Liao et al. discloses all of the limitations of claim 19 as applied above, except for the spool comprising an elastomer material. Liao et al. does

Art Unit: 2874

not disclose or suggest that the spool (23) must be made from any specific material.

One of ordinary skill in the art would have been motivated to form the spool out of an elastomer material in order to provide a spool that will allow flexibility in order to prevent an optical fiber from breaking, since elastomer materials are known and used in the art, and Liao et al. does not disclose that the spool is made from any particular material.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liao et al. (CA 2107922 A1) in view of Korkowski et al. (US 5,432,875).

Regarding claim 20; Liao et al. discloses all of the limitations of claim 20 as applied above, except for specifically stating that the adjustable fiber optic reflection control device is incorporated in an optical system having an optical splitter and a housing, wherein the source end is coupled to the splitter, and wherein the spool, optical fiber and splitter are internal to the housing.

Korkowski et al. discloses an optical system (see Figure 2) comprising an optical splitter (140) and a housing (102), wherein a source end of an optical fiber (130) is coupled to an optical splitter, and wherein the optical fiber (130), a variable attenuator (144) and the splitter (140) are internal to the housing (102). Korkowski et al. further teaches that the optical attenuator (144) is selectively actuated by an operator by means of a knob connected via a shaft to the attenuator and that upon turning the knob the attenuation of a signal along the cable may be varied. Korkowski et al. further teaches that such variable attenuators are commercially available and well known to one of ordinary skill in the art (see column 3, lines 48-56), thereby suggesting that a well known variable attenuator having a knob connected via a shaft to the attenuator be

Art Unit: 2874

incorporated in the optical system. Therefore, one of ordinary skill in the art would have found it obvious to incorporate the variable attenuator of Liao et al. in the invention of Korkowski et al., since Liao et al. discloses a variable attenuator comprising a knob connected via a shaft to the attenuator, wherein turning the knob adjusts the attenuation. Thus, one of ordinary skill in the art would have found it obvious to form an optical system comprising an optical splitter and a housing, wherein the source end of an optical fiber is coupled to the optical splitter, and wherein the spool, the optical fiber, and the splitter are internal to the housing.

Conclusion

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone

Art Unit: 2874

number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.


Michelle R. Connelly-Cushwa
Patent Examiner
May 2, 2005